



Method Summary

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Descriptive Name: Polychlorinated Biphenyls (PCBs) by Gas Chromatography	
Official Name: Polychlorinated Biphenyls (PCBs) by Gas Chromatography	
Method Information	<p>Method Number: 8082A</p> <p>Revision: Revision 1, November 2000</p> <p>Media: WATER</p> <p>Subcategory: Organic</p> <p>Method Source: EPA Office of Resource Conservation and Recovery</p> <p>Citation: SW-846 Update IVA</p>
Brief Method Summary	<p>A measured volume or weight of sample (approximately 1 L for liquids, 2 to 30 g for solids) is extracted using the appropriate matrix-specific sample extraction technique. Aqueous, solid, and tissue samples may be extracted using a number of solvents, separation techniques, and EPA or alternative methods. Extracts for PCB analysis may be subjected to a sulfuric acid/potassium permanganate cleanup (Method 3665) designed specifically for these analytes. This cleanup technique will remove (destroy) many single component organochlorine or organophosphorus pesticides. Therefore, Method 8082A is not applicable to the analysis of those compounds. After cleanup, the extract is analyzed by injecting a measured aliquot into a gas chromatograph with either a narrow- or wide-bore fused-silica capillary column and either an electron capture detector (GC/ECD) or an electrolytic conductivity detector (GC/ELCD). The chromatographic data may be used to determine the seven Aroclors or selected individual PCB congeners, or total PCBs. The method includes analysis of aqueous, solid, and tissue samples.</p>
Scope and Application	<p>Method 8082A is used to determine the concentrations of polychlorinated biphenyls (PCBs) as Aroclors or as individual PCB congeners in extracts from solid, tissue, and aqueous matrices, using open-tubular, capillary columns with electron capture detectors (ECD) or electrolytic conductivity detectors (ELCD). The target compounds includes seven aroclors and 19 individual PCB congeners. These target compounds may be determined by either a single- or dual-column analysis system. The seven aroclors and 19 individual PCB congeners have been tested by this method, and the method may be appropriate for additional congeners and Aroclors. The method also may be applied to other matrices such as oils and wipe samples, if appropriate sample extraction procedures are employed.</p>
Applicable Conc Range	
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Interferences	<p>Interferences co-extracted from the samples will vary considerably from matrix to matrix. While general cleanup techniques are referenced or provided as part of this method, unique samples may require additional cleanup approaches to achieve desired degrees of discrimination and quantitation. Sources of interference in this method include compounds to which the detector responds, such as single-component chlorinated pesticides (including DDT, DDE, DDD), chlorinated aromatics (e.g. chlorinated benzenes), phthalates, and sulfur (S8). Any recalcitrant compound that contains an electronegative element and elutes in the chromatographic window is a potential interferant.</p>
QC Requirements	<p>QA/QC procedures should include a calibration standard after each group of 20 samples (after every 10 samples is recommended) in the analysis sequence as a calibration check. The response factors for the calibration should be within 15 percent of the initial calibration. Whenever quantitation is accomplished using an internal standard, internal standard responses must be evaluated for acceptance. The measured area of the internal standard must be no more than 50 percent different from the average area calculated during calibration. The laboratory must also have procedures for documenting the effect of the matrix on method performance (precision and accuracy). At a minimum, this includes the analysis of QC samples including a method blank and a laboratory control sample (LCS) in each analytical batch, the addition of surrogates to each field sample and QC sample, and routine analyses of matrix spike and matrix spike duplicate aliquots. The laboratory must evaluate surrogate recovery data from individual samples versus the surrogate control limits developed by the laboratory.</p>
Sample Handling	<p>Samples should be cooled to 4 degrees C in the dark. No preservative is necessary unless the matrix includes aqueous samples that contain residual chlorine. Aqueous samples should be extracted within 7 days and the extracts analyzed within 40 days following extraction. Solid samples should be extracted within 14 days and the extracts analyzed within 40 days following extraction.</p>
Max Holding Time	<p>Extracts should be stored under refrigeration in the dark and should be analyzed within 40 days of extraction.</p> <p>NOTE: The holding time above is a recommendation. PCBs are very stable in a variety of matrices, and holding times under the conditions listed above may be as high as a year.</p>
Relative Cost/Effort	\$51 to \$200
Sample Prep Method(s)	<p>Water: 3510, 3520, 3535.</p> <p>Solids: 3540</p>

Method 8082A has 8 analytes associated with it.

Analyte	Detection Level	Bias	Precision	Pct False Positive	Pct False Negative	Spiking Level
PCB-1016 (12674-11-2)	N/A	N/A	N/A			
PCBs (1336-36-3)	N/A	N/A	N/A			
PCB-1242 (53469-21-9)	N/A	N/A	N/A			
PCB-1248 (12672-29-6)	N/A	N/A	N/A			
PCB-1254 (11097-69-1)	N/A	N/A	N/A			

PCB-1221 (11104-28-2)	N/A	N/A	N/A
PCB-1232 (11141-16-5)	N/A	N/A	N/A
PCB-1260 (11096-82-5)	N/A	N/A	N/A
Precision Descriptor Notes	Performance information is included in the method for a number of matrices and extraction methods. The accuracy and precision obtainable with this method depend on the sample matrix, sample preparation technique, optional cleanup techniques, and calibration procedures used. Table 9 provides single laboratory recovery data for Aroclors spiked into clay and soil and extracted with automated Soxhlet. Table 10 provides multiple laboratory data on the precision and accuracy for Aroclors spiked into soil and extracted by automated Soxhlet.		
Detection Level Note	This method may be used to determine Aroclors, some PCB congeners, or "total PCBs," depending on regulatory requirements and project needs. The congener method is of particular value in determining weathered Aroclors. However, analysts should use caution when using the congener method when regulatory requirements are based on Aroclor concentrations. Also, this method is not appropriate as written for the determination of the co-planar PCB congeners at the very low (sub part per trillion) concentrations sometimes needed for risk assessment purposes.		
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